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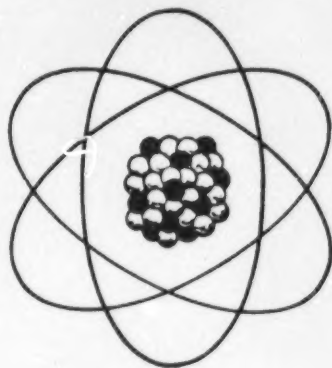
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ABSTRACT

This sixth in a series of eight modules for a course titled Quality Assurance Practices describes the program for qualification of personnel assigned to inspection and test activities. The module follows a typical format that includes the following sections: (1) introduction, (2) module prerequisites, (3) objectives, (4) notes to instructor/student, (5) subject matter, (6) materials needed, (7) procedures, (8) data table, (9) reference materials, (10) test. (The course is one of fifteen technical courses for the second year of a two-year postsecondary curriculum in Nuclear Quality Assurance/Quality Control Technology.) (LRA)

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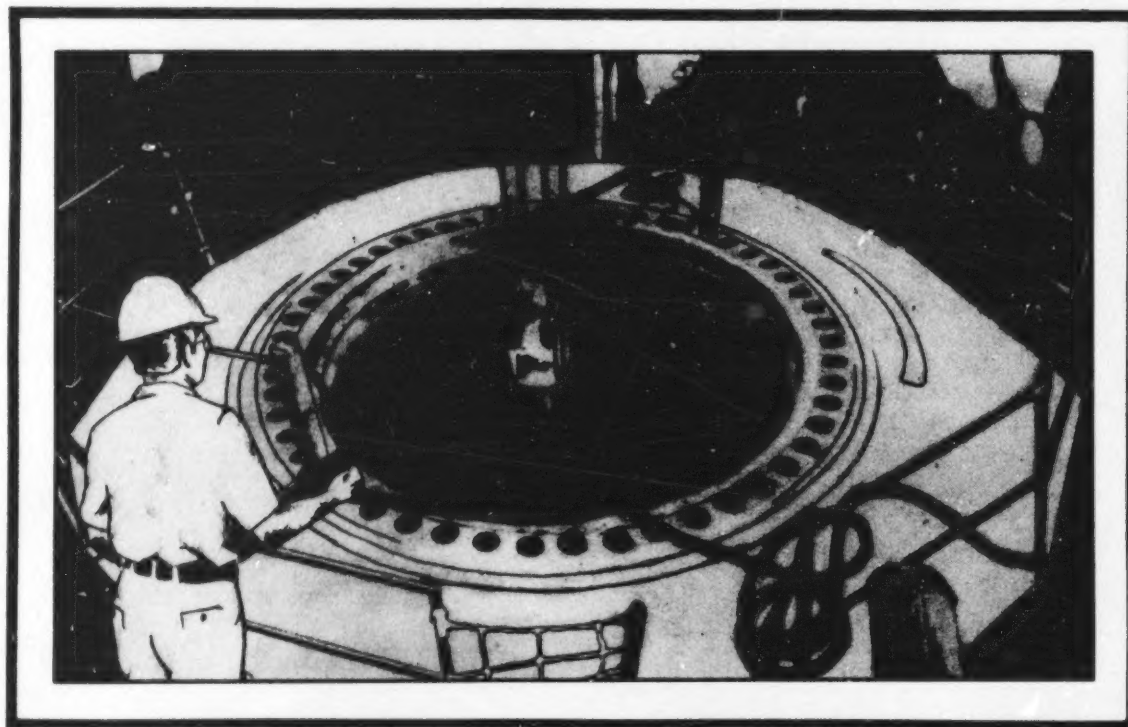
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NUCLEAR TECHNOLOGY

COURSE 31 QUALITY ASSURANCE PRACTICES

MODULE 31-6 Certification and Qualification of Quality Control Inspectors



GENERAL PHYSICS CORPORATION
Columbia , Maryland

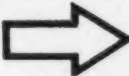
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COURSE MODULES

COURSE 31 QUALITY ASSURANCE PRACTICES

Module 31-1	Overall Quality Assurance Program
Module 31-2	Vendor Qualification
Module 31-3	Receiving Inspection
Module 31-4	Identification, Storage and Handling of Components, Parts and Materials
Module 31-5	Non-Conforming Materials
 Module 31-6	Certification and Qualification of Quality Control Inspectors
Module 31-7	Auditing for Quality Assurance
Module 31-8	Document Handling, Storage and Retrieval for Quality Assurance

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This module was prepared for General Physics Corporation by Jim Pritchard and John Espy, General Physics Corporation.



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INTRODUCTION

A wide variety of inspections, examinations, and tests are performed to determine the acceptability of systems, components and parts to design requirements. Personnel who perform these activities must be certified as having adequate qualifications to competently perform assigned tasks. The Nuclear QA/QC Technician is responsible for becoming qualified for inspections and tests performed by the technician. Also, the Nuclear QA/QC Technician verifies that other organizations qualify their inspectors as required.

This module describes the program for qualification of personnel assigned to inspection and test activities. The qualification program consists of two parts with one part addressed toward nondestructive examination methods and the other part addressed toward all other quality control inspections and tests. A standard governs each part.

The student/trainee should become familiar with the elements of the overall qualification program and gain insight on the methods of obtaining specific qualifications. This will equip the student/trainee to understand entrance requirements into the QA/QC technician field. As will be seen in this module, the Nuclear QA/QC Technician curriculum is preparing the student/trainee to achieve formal qualification after some amount of on-the-job experience.



MODULE PREREQUISITES

The student shall have completed all previous modules of Course 31.



OBJECTIVES

Upon completion of this module, the student/trainee can:

1. Describe the application and the interrelationship of the two standards which govern certification and qualification of quality control inspectors.
2. State the purpose of an employer's written practice on personnel certification.
3. Describe the capabilities of individuals qualified to Levels I, II, and III.
4. Describe the physical prerequisites for qualification.
5. Describe in general terms the educational and experience prerequisites for qualification including the relationship of educational level, training courses, and on-the-job experience.
6. Describe the examination prerequisites for qualification including naming the types of examinations, their purpose, and minimum acceptable grades.
7. Describe the method of calculating composite grades of qualification examinations.
8. Name at least six types of information required for personnel certification records.



NOTES TO INSTRUCTOR / STUDENT

One of the activities suggested by this module is the review of a company's written practice for the certification of personnel. Copies of companies' written practices may be obtained from companies involved in nuclear power plant work such as utilities, construction contractors, and component suppliers.



SUBJECT MATTER

STANDARDS

Regulatory Guidance

Criterion II of Appendix B to 10 CFR 50 includes the requirement that the Quality Assurance Program "shall provide for the indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained". The Nuclear Regulatory Commission (NRC) in its Regulatory Guide 1.58 identifies two standards that give satisfactory requirements for meeting this criterion of Appendix B to 10 CFR 50. These two standards are SNT-TC-1A, "Personnel Qualification and Certification in Nondestructive Testing" and ANSI N45.2.6, "Qualification of Inspection, Examination, and Testing Personnel for the Construction Phase of Nuclear Power Plants".

SNT-TC-1A

The American Society for Nondestructive Testing publishes SNT-TC-1A. This standard applies to the qualification of persons who have responsibilities for any of (1) Radiographic Testing, (2) Magnetic Particle Testing, (3) Ultrasonic Testing, (4) Liquid Penetrant Testing, (5) Eddy Current Testing, (6) Neutron Radiographic Testing, and (7) Leak Testing.

The standard requires the employer to establish a written practice which describes the criteria to be met by individuals for certification in any of three levels of qualifications. Levels of qualification are designated as I, II, and III. The employer's written practice must be consistent with the guidelines of the standard or be technically justified as establishing adequate criteria for qualifications for the specific test responsibilities assigned

to the employee. The standard gives guidelines for qualification criteria in three areas:

- Educational background and experience of the individual.
- Training by the employer or other party.
- Qualification examination administered by the employer.

ANSI N45.2.6

The American Society of Mechanical Engineers and the American National Standards Institute publish ANSI N45.2.6. This standard applies to persons having responsibilities for inspection examination, and test activities that assure the quality of important parts of a nuclear power plant during construction and operation. While the stated scope of the standard is limited to the construction phase, NRC Regulatory Guide 1.58 extends the application of this standard to fabrication of components and to the operations phase including preoperational and startup testing. However, this standard does not apply to those activities whose personnel qualifications are governed by SNT-TC-1A.

The standard requires the employer to identify those inspections, examinations and tests that require use of qualified personnel. The standard further requires the employer to establish a written practice for qualification of these personnel. The standard specifies minimum requirements which must be included in the written practice. Three levels of qualification (Levels I, II and III) are established and minimum requirements for each level are described for three areas:

- Educational background and experience of the employee
- Training given by the employer or other party
- Certification tests administered by the employer.

LEVELS OF QUALIFICATION

Comparison of SNT-TC-1A and ANSI N45.2.6

Both SNT-TC-1A and ANSI N45.2.6 establish three levels of qualification (ANSI N45.2.6 uses the terminology of "levels of capability"). The purposes of each level are essentially identical between the two standards. These levels reflect the typical organizational structure and corresponding skills associated with the various tasks that are necessary to plan for and accomplish an inspection, examination or test. A definitive expertise is required by each level of qualification.

Level III Capabilities

The highest level of qualification (Level III) requires the individual to have broad experience and formal training in performance of inspections or tests and be knowledgeable on the principles and techniques of the inspections or tests. Level III qualification requires the individual to be capable of:

- Planning and supervising inspections and tests
- Preparing, reviewing or approving inspection or test procedures.
- Evaluating the adequacy of inspection or test activities.
- Organizing and reporting results of inspections or tests.
- Certifying the validity of inspection or test results.

Level II Capabilities

The next highest level of qualification (Level II) requires the individual to be experienced and trained in the performance of the required inspections and tests and in the organization and evaluation of inspection results. Level II qualification requires the individual to be capable

of:

- Supervising or maintaining surveillance over others who are actually performing the inspections or tests.
- Calibrating, or establishing validity of calibration, of inspection and measuring equipment.
- Planning and setting up tests or inspections.
- Determining the validity of test results.

Level I Capabilities

The next lower level of qualification (Level I) requires the individual to have experience or training in the performance of inspections or tests and be familiar with the tools and equipment required to carry out the assigned task. Level I qualification requires the individual to be capable of:

- Demonstrating proper use of tools and equipment that are necessary for the inspection or test.
- Demonstrating familiarity with the calibration of inspection and measuring equipment including controls associated with the calibration system such as labeling and recall procedures.
- Verifying that required equipment is in proper operating condition.

PREREQUISITES FOR QUALIFICATION

Summary of Prerequisites

Both SNT-TC-1A and ANSI N45.2.6 give recommended minimum requirements to be met as prerequisites for qualification in each of the three levels. These minimum requirements are not absolutes. Each company's written practice must include prerequisites for qualification which insure the employee possesses the knowledge, skills and physical capacities that are necessary for the inspections and tests

represented by the qualification. Such prerequisites must meet the minimum requirements of the standards or be technically equivalent.

Three categories of prerequisites for qualification are described by the standards: (1) physical, (2) educational and experience, and (3) certification examination. The QA/QC Technician may audit the qualification program for compliance with these prerequisites. Also, in the various monitoring functions, the QA/QC Technician assures that individuals performing inspection and test activities are in fact qualified to the required level. Finally, for those inspections and tests performed by the QA/QC Technician, the individual must meet the qualification criteria and be certified for the qualification level associated with the task.

Physical Prerequisites for Qualification

The physical prerequisites apply equally to any of the three levels of qualification. They pertain to the physical demands on the person to perform the activity and to the human senses (vision, smell, hearing, touch and taste). Of the senses, only vision is normally so important to one's capability of performing inspection and test activities as to merit prerequisite requirements. Inspections and tests involving the other senses normally include apparatus that performs the sensory function and displays or prints out the results. For example, acoustical testing apparatus normally prints out the magnitude and frequency of sound from the item being tested. Physical dexterity is normally tested solely by requiring the person to demonstrate the ability to perform the inspection or test activity. Therefore, the physical prerequisites are limited to (1) near distance visual activity, (2) color discrimination, and (3) other physical prerequisites established by the employer.

- Natural or corrected near distance visual acuity - SNT-TC-1A requires the capability to read with at least one eye Jaeger Number 2 letters (J-2) at a distance of not less than 12 inches or to perceive an Ortho-Rater minimum of 8 or perceive a similar test pattern. ANSI N45.2.6 requires reading of Jaeger Number 1 letters (J-1) or equivalent test for near vision. Both standards permit qualification to these requirements with natural or corrected vision and they require retesting for near vision on an annual basis.
- Color discrimination - Both SNT-TC-1A and ANSI N45.2.6 require testing of color vision when such vision is necessary in the performance of the inspection and test activities. The acceptance criteria is established by the employer based on the color discrimination required by the inspection or test. Examples of such tests are chemistry tests whose results are measured in terms of color changes to a solution or test device. Color vision tests need not be repeated because an individual's color perception does not change with age.
- Other physical requirements established by the employer - Both SNT-TC-1A and ANSI N45.2.6 charge the employer with determining if other physical prerequisites should be established. Where considered necessary, the employer will describe such additional prerequisites in the qualification criteria including the frequency for reexamination of these prerequisites. For example, the capability to interpret radiographs involves the ability to distinguish contrasts in various shades of grey. Therefore, vision tests for radiographic inspectors often include test radiographs which have density pattern of various

densities which must be discerned by the employee.

Education, Training, and Experience Prerequisites for Qualification

The specific prerequisites for education, training, and experience vary with the level of qualification. Again, the standards give minimum requirements that can be adjusted by the employer to give consideration to other qualifying education, training or experience. These prerequisites are considered in composite forms, i.e., higher levels of education permit less on-the-job training and experience prior to qualification while lower levels of education require more on-the-job training and experience. Prior training courses that are specifically related to the inspections and tests also permit reduction of on-the-job experience.

Since the prerequisites for education, training, and experience differ between SNT-TC-1A and ANSI N45.2.6, each are presented separately below.

SNT-TC-1A Prerequisites for Education, Training and Experience

SNT-TC-1A gives recommended training curricula for the seven test methods governed by this standard. Within the curricula, minimum hours of instruction and experience on each topic are established based on the educational background of the employee and the level of qualification to be achieved. Training and experience previously received by the employee may be credited if it specifically covers the topics within the recommended curriculum. Assuming no prior training or experience which specifically pertains to the nondestructive test method, the total hours of training and experience given in Table 31.6-1 are required for Levels I and II qualification.

To be eligible for Level III qualifications, the employee must satisfy any one of the following education and experience

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TRAINING (HOURS)													
	ST		RT		PT		ET		NRT				
	Level I	Level II	Level I	Level II	Level I	Level II	Level I	Level II	Level I	Level II	Level I	Level II	Level II
* See list on page 11 of training course of at least 10 hours of experience in the field (not at a university) or other relevant training.	12	40	8	4	24	40	4	4	8	8	12	40	
** Heavy current, radiation level, radiation level, radiation level.	24	40	12	8	40	40	4	8	12	8	20	40	
*** Heavy current, radiation level, radiation level, radiation level, radiation level.	40	100	24	16	40	40	12	16	40	24	NA	NA	
WORK TIME EXPERIENCE (MONTHS)													
ALL OTHERS (LEVEL I) (LEVEL II)	1	1	1	1	1	1	1	2	1	2	6	24	

	LEVEL I				LEVEL II						
	ST	POST	HLT	MLT	ST	POST	HLT	MLT	Level I	Level II	Level II
* See list on page 11 of training course of at least 10 hours of experience in the field (not at a university) or other relevant training.	12	16	8	16	2	12	6	16			
** Heavy current, radiation level, radiation level, radiation level.	2	24	12	30	4	16	8	24			
*** Heavy current, radiation level, radiation level, radiation level, radiation level.	2	40	40	NA	4	40	40	NA			
WORK TIME EXPERIENCE (MONTHS)											
ALL OTHERS (LEVEL I) (LEVEL II)	1	1	1	1	1	1	1	1	1	1	1

ST = See list on page 11 of training course of at least 10 hours of experience in the field (not at a university) or other relevant training.	RT = Radiographic testing
PT = Heavy current	ET = Magnetic particle testing
ET = Heavy current	NT = Ultrasonic testing
NT = Heavy current	LT = Liquid Penetrant testing
LT = Heavy current	CT = Heavy current
CT = Heavy current	NRT = Neutron Radiographic Testing

Afterwards refer to the Recommended Training Course Tables

NOTES: Training shall be as outlined in the employer's written practice. For level II certification, the experience shall consist of time at level I and level II as a trainee and the hours of training required for level I and level II as total shall apply. Credit for experience may be gained simultaneously in two or more disciplines. The candidate must spend at least 25% of his work time on each discipline for which experience is being claimed.

Table 31-6-1 Recommended Training and Experience Minimum Levels

criteria:

- Graduate of a four-year accredited engineering or science college or university with a degree in Engineering or Science plus one year's experience in nondestructive testing in an assignment comparable to that of an NDT Level II in the applicable test method. If the college or university degree is issued in nondestructive testing the one year's experience requirement can be reduced to six months.
- Completion with a passing grade of at least two years of engineering or science study at an accredited university, college, or technical school plus two years' experience as a certified NDT Level II in the applicable test method, or
- Four years' experience as a certified NDT Level II in the applicable test method, or
- When the individual is qualified by examination, the above requirements may be partially replaced by experience as a certified NDT Level II in other test methods as defined in the employer's written practice.

ANSI N45.2.6 Prerequisites for Education, Training and Experience

ANSI N45.2.6 gives prerequisites for education and experience and charges the employer with establishing policies for crediting related training or other qualifying factors such as qualification in similar inspections and tests by other employers. The prerequisites are as follows:

- Level I
- High School Graduate plus One year experience in Quality Assurance including testing or inspection (or both) of equivalent construction and installation activities.

- Level II
- High School Graduate plus; Four years experience in testing or inspection (or both) of power plants, nuclear plants, heavy industry or other similar equipment or facilities, or
- Graduate of a four year accredited university, engineering or science college plus; at least two years of experience in Quality Assurance including testing or inspection (or both) of equivalent construction and installation activities.
- Level III
- High School Graduate plus; Ten years experience in general Quality Assurance or engineering of equivalent manufacturing construction and installation activities. Five years of this experience is required in Quality Assurance, including testing or inspection (or both) of equivalent manufacturing, construction and installations activities. At least two years of the ten years of experience must be involved with nuclear facilities. in lieu of the two year requirement, sufficient training to acquaint the individual thoroughly with the safety aspects of a nuclear facility will suffice, or
- Graduate of a four year accredited university, engineering or science college plus; Five years experience in Quality Assurance, including testing or inspection (or both) of equivalent manufacturing, construction and installation activity. At least two years of this experience should be associated with nuclear facilities; or sufficient training to acquaint the individual thoroughly with the safety aspects of a nuclear facility will suffice.

Certification Examination

When the employee has met the physical, educational, training and on-the-job experience requirements, a certification examination is given to the employee. Successful completion of the examination provides basis for the employer to issue a certificate of qualification to the employee. These examinations for Level I and II qualifications are administered by or under the direction of the Level III person in the inspection or test method for which qualification is sought. Examination of Level III qualifications are administered by a person authorized by the employer's written practice. SNT-TC-1A gives specific guidelines for these examinations and ANSI N45.2.6 requires use of the guidelines given by SNT-TC-1A.

It is worthy to note that an individual loses his/her certification upon leaving the employer who performed the certification. However, certification can be re-established with a new employer by measuring up to the new employers established practice.

In addition, certification examinations are not restricted to quality assurance/quality control personnel at a nuclear plant. It is often necessary to certify other persons such as maintenance personnel and supervisors to ANSI N45.2.6 because they actually perform surveillance tests, in-service inspection tests, and pre-operational tests. Furthermore these individuals are also involved in approving these test procedures.

The certification examination consists of a two part written test and a practical test. These tests have the following scope:

- Written test, Part I - General - the general test covers the basic test principles relative to the applicable inspection or test method. The employer's

written program must define the extent of this test. This portion is frequently labeled the theory test.

- Written test, Part 2 - Specific - The specific test covers the equipment, operating procedures, and test techniques that the employee may encounter in the inspection or test activities assigned. This portion is frequently labeled the technical test.
- Practical Test - The practical test requires the employee to demonstrate to the satisfaction of the examiner that the candidate is familiar with and can operate the necessary inspection or test equipment and analyze the inspection or test results to the degree required by the level of qualification.

Grading Method for Examinations

The certification examinations are scored using a percentile weight factor for each part. The total of the percentile weight factors must equal 1.0. The score in percentage of correct answers of each part is multiplied by the percentile weight factor and the three products are added to obtain the composite grade as shown in Equation 31-6-1.

Equation 31-6-1

$$G_c = (G_g \times W_g) + (G_s \times W_s) + (G_p \times W_p)$$

where G_c = Composite grade

G_g = Actual grade from general examination in percent

W_g = Percentile weight of general examination

G_s = Actual grade from specific examination in percent

W_s = Percentile weight of specific examination

Gp = Actual grade from practical examination in percent

Wp = Percentile weight of practical examination

Example

Problem: Compute the composite grade obtained by the candidate

Given:

Assigned percentile weight factors:

General examination = .3

Specific examination = .2

Practical examination = .5

Scores obtained by candidate:

General examination = 87%

Specific examination = 72%

Practical examination = 90%

Solution:

$$\begin{aligned} G_c &= (87\% \times .3) + (72\% \times .2) + (90\% \times .5) \\ &= 26.1\% + 14.4\% + 45\% \\ &= 85.5\% \end{aligned}$$

Minimum grades for certification are specified for both the composite grade and grade of each examination. This is based on the premise that a candidate should have an adequate overall expertise and specific expertise in theory, technical requirements, and performance of the inspection or test. Minimum acceptable grades are listed in Table 31-6-2.

Table 31-6-2
Minimum Acceptable Grades

Qualification Level	Examination Grades			
	Part 1	Part 2	Part 3	Part 4
I and II	70%	70%	70%	80%
III	80%	80%	80%	90%

Comparison of Levels of Qualification with Project Functions

The specific inspection and test activity assigned to an individual determines the level of qualification that the individual must possess. Tasks associated with inspections and tests are grouped into categories which parallel the three levels of qualification described earlier in this module. The individual who is assigned those tasks falling into the Level I grouping must qualify as Level I. Likewise, the individual who is assigned those tasks falling into Level II or III groupings must qualify as Level II or Level III. Typical tasks and their associated minimum level of qualification are given in Table 31-6-3. Qualified persons can perform any of the tasks in the levels lower than that qualified for.

Certification Records

Each employer retains records of personnel certifications including bases for the certifications. These records may be a single record format containing all required information or they may be a collection of various records which collectively contain required information. Minimum information contained by these records is:

- name of certified individual
- level of certification and category of inspection or test qualified for

- educational background and experience of the individual
- statement indicating satisfactory completion of training or reasons for waiver of training
- results of physical tests
- individual and composite grades from all examinations
- percentile weights assigned to each examination
- date of certification
- date of employment
- signature of person authorized to issue the certification.

Table 31-6-3
Minimum Levels of Qualification for Project Functions

Project Function	Level I	Level II	Level III
Approve inspection and test procedures			x
Designate the particular test method & techniques	x		
Implement inspection & test procedures	x		
Record inspection and test results		x	
Evaluate inspection and test results		x	
Supervise or monitor the performance of Level I persons		x	
Report inspection and test results & the acceptability thereof		x	



EXERCISES

The following activities reinforce the information presented in this module.

1. Obtain from the instructor a copy of a company's written practice for the certification of personnel and compare it with the content of this module. Note additions or omissions of the written practice and for each, offer rationale on its purpose. Follow the procedure outlined in the Procedures section of this module to assist you in completing this exercise.
2. Determine status of your compliance with prerequisites for qualification as a Level II inspector as contained in this module. Using the Procedures section of this module determine your present status and additional training required to meet the Level II training prerequisites.
3. Describe the applicable and interrelationship of ANSI N45.2.6 and SNT-TC-1A which govern the certification and qualification of quality control inspectors.
4. Describe the capabilities of individuals qualified to Level I, II and III inspectors.
5. Describe the examination prerequisites for qualification including naming the types of examinations, their purpose and minimum acceptable grades.
6. List at least six types of information required for personnel certification records.



MATERIALS

The following materials are required for this module.

1. A sample of actual filled out certification forms
2. A sample of actual personnel experience records.
3. A list of the types of training available by an employer for Levels I, II and III inspectors.
4. Procedures followed by a given company in re-establishing the certification of a new employee who was originally certified elsewhere.
5. Copy of ANSI N45.2.6.
6. Copy of SNT-TC-1A.



PROCEDURES

1. Exercise 1 of this module requests that a comparison be made between a particular company's written practice for the certification of personnel and to compare it with the content of this module.

In order to make this comparison it is suggested that the following be obtained from a local company:

- a. A sample of actual filled out certification forms, (if possible).
- b. A sample of actual personnel experience records, (if possible).
- c. A list of the types of training available by the employer.
- d. Procedures followed by the given company in re-establishing the certification of a new employee who has been certified as an inspector in another company.

In addition to this, copies of ANSI N45.2.6 and SNT-TC-1A will be helpful along with the module notes to make this comparison.

2. Exercise 2 of this module requests that you make a determination of your own status in complying with the prerequisites for qualification as a Level II inspector. In order to do this you will need to do the following:
 - a. Make the determination by first extracting from this module the physical and educational and training prerequisites for Level II.
 - b. List your training and experience based on completion of the curriculum in which you are enrolled and on prior experience.
 - c. Compare your listing with Table 31-6-1 of this module and determine your status in meeting the recommended minimum hours of training.



DATA TABLE

Not applicable.



REFERENCE MATERIALS

- NRC, Regulatory Guide 1.58, Qualification of Nuclear Power Plant Inspection, Examination, and Testing Personnel, U.S. Nuclear Regulatory Commission, 1973
- ASME, Qualifications of Inspection, Examination, and Testing Personnel for the Construction Phase of Nuclear Power Plants, ANSI N45.2.6, The American Society of Mechanical Engineers, 1973
- ASNT, Recommended Practice for Personnel Qualification and Certification in Nondestructive Testing, SNT-TC-1A, American Society for Nondestructive Testing, 1975
- Juran, J.M., Quality Control Handbook. McGraw-Hill, 1974



TEST

Answer the following questions as either true or false:

- _____ 1. The Nuclear Regulatory Commission recognizes two standards as describing the acceptable requirements for the certification of quality control inspectors: SNT-TC-1A, "Personnel Qualification and Certification in Nondestructive Testing" and ANSI N45.2.6, "Qualification of Inspection, Examination, and Testing Personnel for the Construction Phase of Nuclear Power Plants".
- _____ 2. ANSI N45.2.6 applies to the qualification of persons who have responsibilities for radiography, magnetic particle, ultrasonic, liquid penetrant, eddy current, neutron radiography, and leak testing.
- _____ 3. SNT-TC-1A applies to all other quality control inspections and tests.
- _____ 4. Both SNT-TC-1A and ANSI N45.2.6 requires the employer to establish a written practice which describes the criteria to be met by individuals for certification to one of three levels.
- _____ 5. Employer's written practices stipulate qualification criteria in three areas: (1) starting salary, (2) work - related hobbies, (3) previous military experience.
- _____ 6. Levels of qualification in order of ascending requirements are III, II, and I respectively.
- _____ 7. Level I qualification requires the individual to be capable of (1) planning and supervising inspections and tests, (2) preparing, reviewing, or approving inspection and test procedures, (3) evaluating the adequacy of inspection or test activities, (4) organizing and reporting results of inspections or tests, and (5) certifying the validity of inspection and test results.

- ____ 8. Level II qualification requires the individual to be capable of (1) supervising or monitoring others who perform inspections or tests, (2) calibrating, or determining validity of calibrations, of measuring and test equipment (3) planning and setting-up tests or inspections, and (4) determining the validity of test results.
- ____ 9. Level III qualification requires the individual to be capable of (1) demonstrating proper use of tools and equipment, (2) demonstrating familiarity with calibration controls, and (3) verifying that required equipment is in proper operating condition.
- ____ 10. Candidates are certified based on their compliance with the prerequisites associated with (1) physical criteria, (2) educational and experience criteria, and (3) examination criteria.
- ____ 11. Physical prerequisites are comorized of (1) near distance visual acuity, (2) color discrimination, and (3) Being able to run the mile in 4.5 minutes.
- ____ 12. Prerequisites for educational background and experience are considered in composite form whereby on-the-job experience prerequisites decrease as educational level and specific training increases.
- ____ 13. Prerequisites pertaining to the examinations require the candidate to achieve acceptable grades on a three part examination: (1) general, (2) specific, and (3) practical.
- ____ 14. For Levels I and II qualification, minimum acceptable examination grades are 80% on individual examinations and 70% for the composite grade.
- ____ 15. For Level III qualification, minimum acceptable examination grades are 80% on individual examinations and 90% for the composite grade.

16. Composite grades are calculated by adding the products of individual grades time percentile weights plus adding on an additional 5 percent if the individual is a war veteran.

Answer the following essay questions.

1. Briefly explain the application and interrelationship of ANSI N45.26 and SNT-TC-1A.
2. What is the purpose of an employer's written practice on personnel certification.
3. Briefly describe the capabilities of individuals qualified to Levels I, II, III inspectors.